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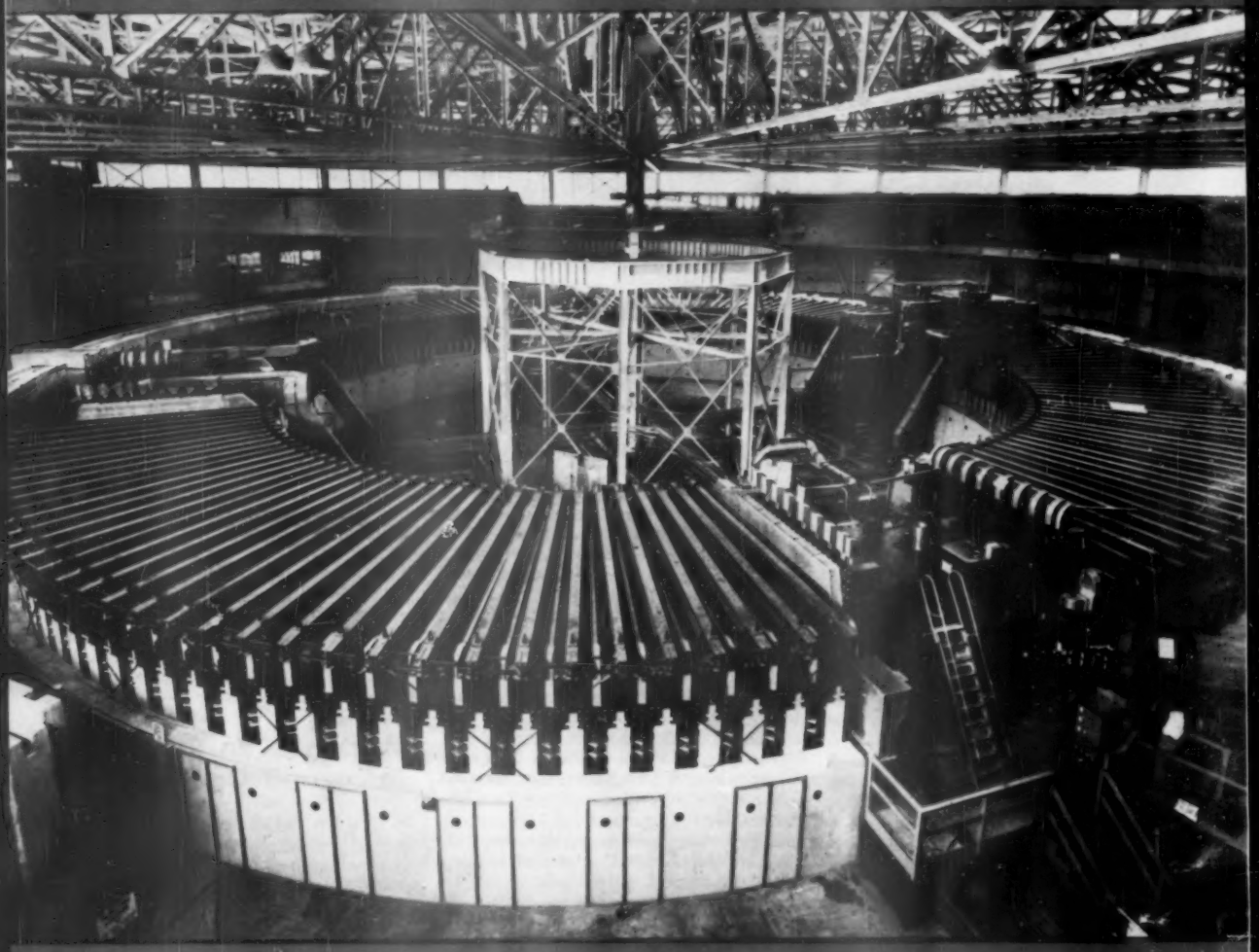
THE WEEKLY SUMMARY OF CURRENT SCIENCE



Created Anti-Matter

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A SCIENCE SERVICE PUBLICATION

MEDICINE

Horseradish and Blood Figure in Nobel Prize

➤ RESEARCH on a horseradish chemical and on blood are included in the studies for which the 52-year-old Swedish biochemist, Prof. Axel Hugo Theorell (pronounced Tee-o-rell), won the 1955 Nobel Prize for medicine.

The horseradish chemical is peroxidase. This enzyme catalyzes, or sparks, the transfer of oxygen from hydrogen peroxide or other peroxides to another substance. The horseradish peroxidase is a hemoprotein.

Prof. Theorell and associates achieved the reversible splitting of it into hemin, a chemical related to the red color chemical of blood, and protein. Then Prof. Theorell put the two parts together again, getting a preparation with the same enzyme action as the original horseradish peroxidase.

Before his work on the horseradish chemical, Prof. Theorell won fame for separating blood components by electrophoresis. He demonstrated this at a physiological congress in Leningrad in 1935.

Much of his scientific work has been on enzymes that have a central and prominent part in the respiration processes by which the body cells get and use oxygen. Recently he has been stressing the important role of chlorine in connection with another respiration enzyme, cytochrome.

Prof. Theorell is "a very fine chap" and the leading biochemist in Sweden, one of his scientist friends in this country told SCIENCE SERVICE.

He is a stocky man who walks with quite a limp due to polio. Music and boating are among his hobbies.

The boating apparently is done on a large scale since he is said never to think "of any boat less than 50 feet." He plays the violin and piano. His wife teaches piano and is harpist with the Stockholm Symphony Orchestra. He is on the orchestra's board of directors.

Prof. Theorell is head of the Medical Nobel Institute at Stockholm and is said to be the chief selector of Nobel Prizes in biochemistry. Every year he goes off on an island and spends a month there reading research reports by candidates nominated for that year's prize.

He is also believed to have helped save another Nobelist, Prof. Albert Szent-Gyorgyi, from the Nazis in Budapest during the war. Prof. Szent-Gyorgyi found shelter in the Swedish Legation in Budapest where he was employed as a chauffeur before his escape to Moscow and eventually to the United States.

Prof. Theorell was born in Linkoping, the Swedish town where underground plane factories are now being built.

Science News Letter, October 29, 1955

Ears of 60 vertebrate and invertebrate animals will be studied in a new research project aimed at increasing understanding of the human ear and its diseases.

EUROPEAN BISON — This pair of European bison, or wisents, newcomers to the Washington, D. C., zoo, are the first seen in this country in 30 years. In all the world there are possibly only about 100 of these rare animals surviving.

MAMMALOGY

Rare Bison in Zoo

➤ TWO of the world's rarest large mammals moved into the U. S. National Zoo in Washington, Director William Mann has revealed.

An air of mystery surrounds the coming of these European bison, or wisents, since the animal dealer from whom they were obtained refuses to tell where the animals came from.

According to a 1947 census, 75 of the 97 wisents then alive were found in Poland, Russia and Germany. Did Dr. Mann's wisents, which he has been trying to obtain for years, come from behind the Iron Curtain?

The European bison, a streamlined but larger version of their North American cousins, came with pedigree papers from the dealer, Karl Hagenbeck of the famous animal-dealing family, guaranteeing that they are pure-blooded. But that is about all Dr. Mann could learn about them. He was unable to learn whether or not the wisents are of the Lithuanian or Caucasian sub-species, since presumably this might give a clue to their origin.

Dr. Mann's pair of wisents are the first to be seen in this country for some 30 years.

These European bison are woodland animals, adapted for browsing from trees, unlike the prairie-grazing American bison. They are higher at the shoulder, have longer legs and a longer total length than our "buffalo." The mane is thinner, but the coat on the hindquarters is much thicker.

The wisent roamed nearly all of Europe in prehistoric times. Many of the pictures painted on cave walls by primitive Europeans were of this beast. Julius Caesar saw wisents during his invasions of Germany and Belgium.

By the first of the 20th century, however, the wisents were extinct in the wild state, and have only managed to survive in their limited numbers—probably less than 100 pure-bloods—in zoos and protected parks.

Science News Letter, October 29, 1955

ELECTRONICS

Machine Can Replace Telegraph Operator

➤ EVEN TELEGRAPH OPERATORS can be replaced by machines.

An electronic device is now ready for production that can translate international Morse code signals from radio beeps to typed copy. Described as the first successful machine of its kind, the Trak Automatic Code Converter overcomes a major problem by automatically adjusting itself to different speeds of transmission. It can even compensate for the sender's change of pace within a single message.

The robot radioman can handle signals produced by hand or machine keying.

The device was demonstrated by the CGS Laboratories, Inc., Stamford, Conn.

Science News Letter, October 29, 1955

PHYSICS

Anti-Proton Discovered

When this strange particle strikes an ordinary proton, both are completely annihilated. The discovery is expected to spur a new era in nuclear research.

See Front Cover

➤ EVIDENCE that the strangest nuclear particle, the anti-proton, actually exists was announced by Dr. Ernest O. Lawrence of the University of California, Berkeley, and simultaneously by the Atomic Energy Commission.

Annihilation of matter would result from the explosion caused by a meeting of the anti-proton with its opposite number, the proton. Protons are hearts of hydrogen atoms.

Theoretically possible, the anti-proton has been announced several times in recent years, only to meet disproving evidence. Yet scientists still believed in the possibility of finding in cosmic rays or creating in giant accelerators this negative counterpart of the proton.

Now the newest contestants for the honor of finding an incontestable anti-proton are Drs. Owen Chamberlain, Emilio Segre, Clyde Wiegand and Thomas Ypsilantis of the University of California. They were aided by Herbert Steiner and Dr. Edward J. Lofgren.

They created the negatively charged particle in the bevatron, the University's huge cyclotron of improved design. This machine, shown on the cover of this week's SCIENCE NEWS LETTER, is capable of accelerating particles of relatively heavy masses to energies measured in billions of electron volts.

New Research Era

A new era of nuclear research, rivaling that which led to the atomic bomb, is foreseen by Dr. Lawrence as the result of the anti-proton creation.

The antiproton is a heavy particle of the same mass but of opposite electrical charge from the proton, which is one of the fundamental particles found in all atomic nuclei.

The particles are created when protons, the nuclei of hydrogen atoms, are fired in the bevatron at an energy of 6.2 billion electron volts. When one of these protons hits a neutron, part of the original energy of the projectile particle is converted into two new particles—an anti-proton and a proton. Nearly a billion volts goes into each new particle.

The existence of such particles has been suspected for a generation. Physicists have based their calculations on a belief in anti-protons. But the particles had never been identified, and the long lag had caused some physicists to doubt the reality of anti-protons.

One of the major results of the discovery is to eliminate doubt about one of the basic tenets of atomic physics. By clearing the nuclear air, physicists may now be able to forge ahead to new ground. Studies of the action of the particles may lead to new insight into the nucleus.

As Dr. Lawrence, Nobelist and cyclotron inventor, stated it: "Recalling that at the beginning of the past quarter century the discovery of the positive electon set off the remarkable developments in nuclear physics that followed, one cannot help but wonder whether the discovery of the anti-proton . . . likewise is a milestone on the road to a whole new realm of discoveries in high energy physics that are coming in the days and years ahead."

Charged atomic particles occur, according to theory, in pairs with electric charges of opposite sign. The meeting of two such particles, alike except for their charges, results in an explosion which turns the material particles into bursts of energy. This has been found to be true when an electron, which has a negative charge, meets its positively charged twin, a positron. Such meetings have been recorded on photographic film. Tracks caused by the oppositely charged particles vanish in the record of an explosion, and different kinds of tracks, evidence of waves of energy, are found leaving the site of the collision. A much greater explosion would result from annihilation of the larger particles, proton and anti-proton.

Protons, which are much heavier nuclear particles than electrons and positrons, are always found carrying positive charges only. Yet there should theoretically be similar particles with negative charges. Physicists have named these anti-protons and have guessed that they may exist outside earth's atmosphere. Tracks ascribed to anti-protons were found in cosmic ray studies reported in 1951 by Dr. J. G. Retallack of Indiana University, Bloomington, Ind. In April, 1954, Dr. Bruno Rossi of Massachusetts Institute of Technology reported to the American Physical Society a "most unusual" cosmic ray photograph in which he believed he had found evidence of the anti-proton.

In the same year the annihilation of matter seemed to have been signalled in a burst of cosmic ray energy of ten million billion electron volts discovered by Prof. Marcel Schein and colleagues of the University of Chicago in a photographic emulsion flown to 100,000 feet altitude.

Prof. Schein concluded that this extraordinary event was the actual annihilation of "anti-matter," an anti-proton that came in from outer space.

There is no known "practical" application of the anti-proton discovery. No one can imagine now, for example, how anti-protons could be used to generate energy, as neutrons do in fission.

The discovery does not change the familiar planetary model of the atomic nucleus. The discoverers pointed out that antiprotons do not "live" in nuclei, as do protons and neutrons. They can "live" only outside nuclei.

Prior to completion of the Bevatron, the only previous source of anti-protons was believed to be cosmic rays. It is suspected that anti-protons are rare, however, in cosmic rays, and this rarity is the reason they had not been identified earlier in nature.

The experiments so far, University of California sources report, have been done with a variety of radiation counters. Attempts are now being made to detect anti-protons on photographic emulsions and in cloud chambers placed in the bevatron beam. Such photographs might help to clarify mysterious uninterpretable cosmic ray events photographed in the past.

Devise Maze

Essentially, the Berkeley scientists devised a series of selecting instruments which formed a kind of "maze" through which only particles with those characteristics predicted for the anti-proton could go.

The scientists had to find a particle with a negative charge and a mass equal to that of the proton.

The charge was determined automatically, since the particles were in the beam of negative particles bent outside the bevatron magnet.

The mass was determined by measuring the momentum and velocity of the particles. The momentum was obtained by the curvature of the particles in two magnetic fields.

Velocity was measured by 1. a "stopwatch" timing of the flight of anti-protons between two counters; and 2. the use of a novel fused quartz Cerenkov counter developed by Drs. Chamberlain and Wiegand.

The scientists said the mass of the particles they have observed is equal to that of the proton, with an error of five per cent. The anti-protons are stable in a vacuum, and do not decay (disintegrate) spontaneously. Mesons, on the other hand, have a short lifetime, and quickly decay.

The anti-proton does annihilate (vanish, giving rise to some other form of energy) when it comes into contact with matter. When, for example, the anti-proton comes into contact with a proton, the two particles immediately transform into mesons, which quickly disappear.

The discovery verifies the electrical charge symmetry of nature—for each known charged particle there is a particle of equal mass with opposite charge.

The first evidence for anti-protons came in bombardments on Sept. 21. About 50 antiprotons have been observed. The scientists decided the evidence was conclusive after bombardments on Oct. 17.

CONSERVATION

Flood States Not Prepared

➤ WATER-LOGGED citizens of the northeastern states were partially to blame for the recent rash of devastating floods.

Of 410 applications from throughout the nation asking for flood control help, only six came from the six hardest hit states, according to the U. S. Soil Conservation Service in Washington.

Pennsylvania had asked for help for three areas. Massachusetts, New Jersey and New York each had one application, while Connecticut and Rhode Island had none.

This is in contrast to one Midwestern state which has applied for help in 140 watershed areas.

Any guilty conscience on the local citizens' part, however, must come from hindsight, since the Northeast is not used to so much water. The greatest rainfall recorded for the Hartford, Conn., area before hurricane Diane was 6.82 inches, back in 1897. But in the 36 hours of Diane, 12.05 inches fell.

During the sudden four-day storm that hit Hartford, 6.62 inches fell on already sodden ground, three inches of it in a 24-hour period.

Reports indicate that the citizens of these states are preparing a flood of their own—a deluge of applications to the Soil Conservation Service for help in planning flood control for the future.

They will seek help under Public Law 566, the watershed protection and flood prevention act, which allows the SCS to help with watershed development planning when asked for by local citizen groups.

When the plans are completed, the areas requesting aid submit the plan plus a cost-sharing proposal to Congress. If there is no negative action from the Congress in 45 days, the SCS is authorized to help the district under the terms of the plan. Federal assistance is technical and financial.

Chief feature of the watershed method of flood control is the building of reservoirs at the heads of streams, which hold back a sudden rush of water downstream brought on by cloudbursts.

Results from watershed development projects already completed indicate the effectiveness of this program. Two severe storms in the Sandtone Creek, Okla., watershed — which is well supplied with water reservoirs—caused floods over only 588 and 200 acres of lands, respectively, compared with an estimated 2,160 and 2,110 acres which would have been under water without the development.

Science News Letter, October 29, 1955

MEDICINE

Anti-Stroke Drugs

➤ HOPE OF preventing strokes of apoplexy by anti-blood clotting drugs now used for some heart patients appeared in a report to the American Heart Association here this morning.

A "striking decrease in mortality" followed this treatment in 53 carefully selected cases, Drs. Robert G. Siekert and Clark H. Millikan of the Mayo Clinic, Rochester, Minn., reported.

The mortality in this group was 14% compared to 43% in a similar group that did not get the anti-clot treatment.

The treatment would be for those in whom certain warning signals suggest a clot is forming that may eventually obstruct a major brain artery.

Many strokes, however, are caused by a rupture of weakened blood vessel walls in the brain. The anti-clotting drugs cannot be used in such cases.

The 53 patients treated improved greatly and had no further "spells," the doctors reported. They also seem to have been spared the usual progression of their symptoms to a major stroke.

The "spells" which are the warning signals of impending stroke include temporary episodes of loss of control of legs or arms. Brief periods of trouble in seeing, numbness, and confusion are other signs that may mean a stroke is on its way. Such symptoms, especially the almost momentary confusion, have been called "little strokes."

Laminated blood clots in one of the major arteries to the brain, called the basilar artery, gave a clue to the possibility of preventing strokes by the anti-clot drugs.

Clots found in this artery in examinations after death often had a laminated or layered physical structure, the doctors found. This suggested that the clots had been laid down over an extended period of time, much as a tree trunk grows in width by adding an annual ring.

The doctors reasoned that the layers in the clot probably coincided with the temporary "spells" that often come in step-like fashion as the artery is gradually narrowed by a developing clot or thrombus.

Other patterns of warning symptoms were known to be associated similarly with clots in another major artery to the brain, the internal carotid artery.

Besides the decrease in mortality after the anti-clotting treatment, the doctors reported "a surprising amount of improvement in the neurologic abnormalities."

Although they state more study is needed and patients must be carefully selected, they think the treatment appears "to be of great value in certain conditions."

Use of anti-clotting drugs to prevent strokes has been suggested previously by doctors using the drugs in treatment of heart and blood vessel disease. Drs. Irving S. Wright and Ellen McDevitt of Cornell University Medical College, New York, announced that patients getting the treatment developed markedly fewer blood clots in the brain compared to the number before the treatment was started. (See SNL April 17, 1954, p. 253.)

Science News Letter, October 29, 1955

Representatives of industry and government have expressed dissatisfaction with the *writing* ability of college graduates in chemistry and chemical engineering.

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WILDLIFE

Near-Extinct Deer Helped

➤ THIS YEAR seems to be a good one in the battle for survival of near-extinct wildlife.

The nation's tiniest deer, numbering only about 112 individuals, have been given a larger toe-hold on survival with the acquisition of 71 more acres as an addition to their last-stand refuge in the Florida Keys, the U. S. Fish and Wildlife Service has revealed.

This follows hard on the heels of a victory won by conservationists against the U. S. Air Force which wanted to establish a photo-flash bombing range practically in the front yard of the last of the whooping cranes' winter refuge in Texas.

The diminutive Key deer, only about the size of a collie when full grown, has been able to reach its present numbers from a low of 32 in 1951. However, FWS officials feel that a herd of 200 is the minimum that will assure survival of the race.

With the new lands, the National Key Deer Refuge now includes just under 1,000 acres of the deer's native habitat on the mangrove-dotted keys.

The names of some of the wild, tangled keys where the tiny deer live are as unique as the animals themselves. According to a survey last April, there were 30 Key deer on Big Pine Key, 11 on No-Name Key, five on Ramrod and only two on Knockemdown.

The Key deer seem to have no major enemies on the keys beyond those made by man—fire and automobiles. Deaths by autobiles probably account for the majority of deer losses, though most of the 12 islands they inhabit are off the much traveled Overseas Highway to Key West.

The Key deer is the smallest of all North American deer, only about 26 to 29 inches tall, 38 inches from nose to tail, and averaging only about 30 pounds.

Though a few naturalists think they are a separate species, the Key deer is generally considered to be only a subspecies, or variation, of the common white-tailed deer, which may weigh up to 200 pounds.

The National Key Deer Refuge also affords protection to the roseate spoonbill; the great white heron, largest of the American herons; and the white-crowned pigeon, which is found in the United States only in the Florida Keys.

Science News Letter, October 29, 1955

AERONAUTICS

Radar for "Air Cops"

➤ AIR "TRAFFIC COPS" will need "radar, radar and then some more radar" to keep up with the mammoth air jam envisioned in the next ten years.

Civil Aeronautics Administrator Frederick B. Lee said that we will have to give each air traffic control station an instantaneous picture of the traffic in its sector, and a confusion-free method of identifying and dealing with individual aircraft.

Whizzing commercial jets and speedy turboprops will further complicate the already complicated problem with their high altitude flights.

The Civil Aeronautics Administration, he said, has a ten-year program of air traffic control improvements designed to loosen the jam. It includes a secondary radar beacon system with an airborne device that returns stronger signals that can penetrate rain and other clutter. More important, he said, the device returns a coded impulse for positive identification of the plane.

This system is now being evaluated and is expected to be ready for installation early in 1957.

More surveillance radar for airport control towers is needed and more long range radar for air route traffic control centers must be installed.

The program eventually could permit separation of aircraft by only a few miles instead of the ten minutes now required. Under that standard a jet must have a 100-mile-long block of space reserved for its flight.

To move taxiing ground traffic smoothly, Airport Surface Detection radar will also be needed at busy airfields.

In addition to radar, navigational aids for air highways must be expanded upward and downward to pack more planes into a stretch of airway. Navigational aids would cover the entire airspace between 18,000 and 75,000 feet above the ground for turbine-powered planes and also down to 700 feet for pilots of smaller craft who fly under clear-weather rules. To complete this program, it will be necessary to more than double the present number of navigational aid installations.

Mr. Lee said, "if the nation is going to spend more than $100,000,000,000 in the next ten years on civil and military aircraft, it is a real bargain if we can make possible full utilization of those planes by investing a fraction of one percent of their cost in an adequate airways system."

Science News Letter, October 29, 1955

Over 17,000,000,000 *tin cans* were manufactured in the United States during the first half of 1955.

Conclusive proof has been found that *ozone*, sometimes called "supercharged" oxygen, is formed in polluted air by a sunlight-aided reaction.

EMBEDDED SKULL—A tritylodont skull, still in its sandstone matrix, is measured by John Ostrom, a research assistant for The American Museum of Natural History.

PALEONTOLOGY

Missing Link Fossils Found in Arizona

➤ FOSSIL HUNTERS in Monument Valley, Arizona, have discovered a large deposit of "missing links" in the chain of evolution between reptiles and mammals, the American Museum of Natural History has disclosed.

An American Museum expedition to the Arizona "bone mine" this summer brought back at least a dozen rare skulls and several joined skeletons of the tritylodont. This extinct animal belongs to a group thought to represent the last step through which mammals evolved from reptiles.

Until the Monument Valley find, fossils of these animals, which lived about 175,000,000 years ago in the upper Triassic period, had not been discovered in this hemisphere. Only a few skulls, skeletal bones and fragments had been found previously in South Africa, China and England. But because of the lack of sufficient material, scientists' ideas about the nature of this transitional animal had to come largely from speculation.

The new finds are expected to reveal a great deal, not only about these animals themselves, but about evolution as a whole, said Dr. Edwin H. Colbert, curator of fossil reptiles and amphibians at the museum. Dr. Colbert headed the museum's expedition that brought back the fossils.

The tritylodonts belong to the most advanced group of mammal-like reptiles, the ictidosaurs, Dr. Colbert said. They had almost crossed the threshold separating reptiles from mammals. Tritylodonts had the multiple-boned lower jaw of the typical reptile as well as the multiple-cusped teeth common to mammals, he said.

Science News Letter, October 29, 1955

NATURAL RESOURCES

Russians Tap Sunshine

Solar energy promises to rival atomic energy in the development of backward nations. One of the first glimpses of what the Russians are doing in this field is reported.

➤ HOT WATER in the public baths of Askhabad on the border between Soviet Russia and Iraq, is already being heated by the sun's rays. This is done by solar heating devices developed by the Russians "for the sunny regions of the Central Asian Republics of the U.S.S.R."

In an article published in India, describing the water heating device, refrigerators run by solar energy, and other applications, Dr. V. A. Baum, head of the Heliotechnical Laboratory of the G. M. Krzhizhanovsky Power Institute in Moscow, tells how these applications of the sun's energy work.

Dr. Baum will become the first Russian physicist to visit the United States since World War II when he comes here to attend the World Symposium of Applied Solar Energy in Phoenix and Tucson, Ariz., Oct. 31 through Nov. 4. The U. S. State Department has announced that Dr. Baum will be allowed to attend the conference under regulations authorized by the U. S. Information and Exchange Act of 1948.

The Russian expert will share technical information with scientists from many other countries who seek ways to utilize the millions of calories of heat poured down yearly by the sun onto the earth's arid regions.

Experimental installations built in Russia under Dr. Baum's direction range from the simple glass-covered "hot frame," similar to those used by gardeners in this country to give plants an early start in the spring, to a solar boiler with a paraboloid mirror of 80 square meters (85 square yards) surface which produces 50 to 60 kilograms (about 110 to 130 pounds) of steam per hour, at a pressure of seven atmospheres.

See Solar Electricity

Utilization of the steam to run electric generators to produce power is foreseen by Dr. Baum, if the apparatus can be set up in regions where the sun shines at least 150 to 200 days out of the year.

In less sunny areas, in connection with the kinds of storage tanks, heat exchangers, and refrigeration machinery already in use, Dr. Baum believes that solar energy could be used for heating and air-conditioning for at least part of the year. His apparatus will produce 250 kilograms (about 500 pounds) of ice per day, or distill 1,000 liters (264 gallons) of water per day. Distillation of sea water is one of the projects where solar energy will first find large-scale use, in the opinion of many experts.

Conceding that house heating by storage of heated water in insulated tanks is impractical for most parts of the world, Dr. Baum feels that the cost of the installation of mirrors to collect sunlight would not seem so great if the mirrors can be used for more than one purpose, at different times of the year.

The solar energy plant could manufacture ice in summer, begin to accumulate heat for winter as the days grow cold in autumn, and save heated water for use on days when the sun does not shine.

Trying to produce useful solar energy devices at a minimum cost, Dr. Baum stresses the usefulness of the simple box with a glass top slanted to catch the sun's rays for drying fruits and vegetables. A simple mirror not very accurately figured (mirrors are cheaper than lenses) will do for solar cooking. The mirror would be focused by hand, the heat would be concentrated on the bottom of the saucepan, the pan might have to be moved once or twice before the cooking was done. But the saving in fuel might offset the trouble in many parts of the world.

Problems that need immediate attention by the world's scientists are listed by Dr. Baum in the following order:

1. Designing a cheap and simple mirror and mechanism for revolving it.
2. Finding a cheap and simple method of accumulating the energy of the sun for different periods of storage, and of discharging the accumulator.
3. Finding automatic controls, making the machine fool-proof and cutting down operating costs.
4. Designing apparatus to make it possible to obtain considerable power from each single unit with a high efficiency.

Longer-range theoretical and practical tasks for study by scientists recommended by Dr. Baum include:

1. Study of the radiation and thermal balance of the earth and its separate regions.
2. Rational distribution and use.
3. Methods of transforming the energy of the sun not only into heat, but into other forms of energy by means of photoelectric, thermoelectric, photochemical and other processes.
4. Designing apparatus for the use of solar energy.
5. Elaboration of schemes for complex use of solor energy for various purposes.

Interest in use of solar energy runs high in India, where the sun is hot but fuel for fire is very scarce. The Russian scientist's article appears in the current issue (August, 1955) of the *Journal of Scientific and Industrial Research*, published in New Delhi.

Science News Letter, October 29, 1955

AGRICULTURE

Red Arctic Farms Doomed

➤ RUSSIA'S PLAN to send settlers to the frozen wastes of Siberia will result in death or dispersal of the people unless food is brought in from elsewhere to feed them.

This is the prediction of Nestor Korol, a former head of research for the Russian Scientific Research Institute of Northern Grain Farming in Moscow.

Reporting in *Science* (Oct. 14), Mr. Korol said that about one half of the entire territory of Russia, 4,053,000 square miles, lies in the zone of perpetual frost. One third of Russia, 2,702,000 square miles, is bathed in cold which prevents soil from thawing out enough to allow farming at any time of the year.

Mr. Korol said tests at Soviet agricultural experiment stations proved that farming in the remaining 1,351,000 square miles in the perpetual frost zone will probably never be able to assume any industrial importance. In exceptional cases, such as in the southernmost reaches of the frost zone, cultivation might secure enough grain and vegetables for family use, but only if the population does not increase much, he said.

The Soviet policy of building up populations in this perpetual frost zone, as well as in the deserts and semi-deserts of Kazakhstan, will result in either death or dispersal of the people, or their being supplied with food from other regions, Mr. Korol said.

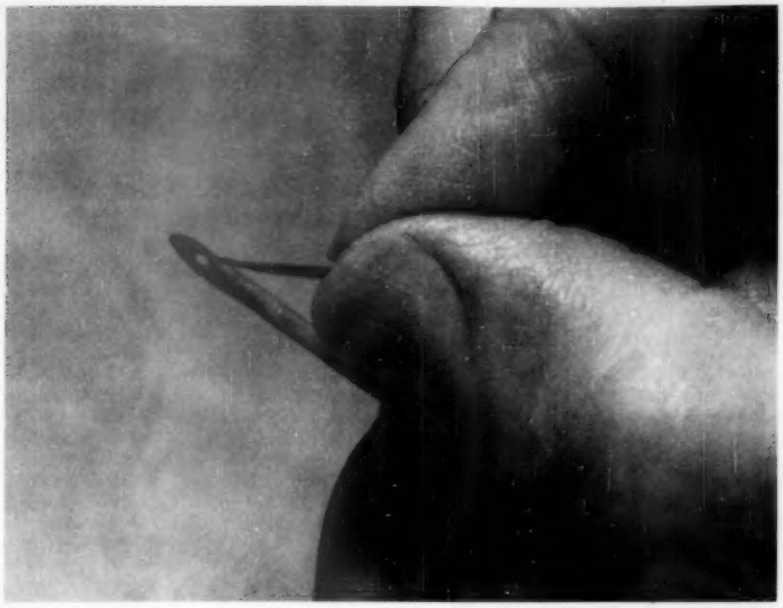
Attempts to cultivate lands in the perpetual frost belt have met with a long series of frustrations. The ground itself may be frozen as deep as about 1,640 feet in the crust of the earth. Often, great layers of solid ice up to about 164 feet thick lie buried under the soil. When steps are taken to thaw this kind of ground, the resulting mass of freed water often turns the "farmland" into lakes or swamps.

On other ground, annual thawing and freezing that accompanies cultivation leads to destruction of the soil structure and turns it into hard lumpy crusts that defy the plow.

Where crops are finally grown within the perpetual frost zone, they are usually best in the second year, Mr. Korol said. But after another year or so, the crops "catastrophically diminish," often failing to return even the seed.

That much of this land has been frozen for countless thousands of years is proven by the presence of "deep-frozen" mammoths, haired rhinoceroses and other long-extinct animals buried in the earth. Their carcasses show no signs of decomposition thousands of years after death.

Science News Letter, October 29, 1955



TINY TOOLS — Here is how a Dorset Eskimo made the eye hole in a needle. The minute sharp-edged tool and the needle were found by archaeologists in the Canadian Arctic.

ANTHROPOLOGY

Compare Eskimo Cultures

Evidence found that the Dorset Eskimos were the dominant culture in the Canadian Arctic for more than 1,000 years. These people used tiny tools to produce delicate work.

➤ WITHIN 40 MILES of the site of the oldest Eskimo dwellings in the central Arctic, Smithsonian archaeologist Dr. Henry B. Collins this summer discovered a comparatively very recent site of the same Dorset Eskimos.

The find provides important evidence that the Dorset people lived in the Arctic region in unbroken continuity for more than a thousand years and that the Dorset culture was the dominant, pervasive culture in the eastern part of the Canadian Arctic during all that time. They did not disappear long ago as some scientists have thought.

The new site is on Walrus Island, a small granite islet barely a mile long. It is just 25 miles across the waters of Hudson Bay from Southampton Island and only 40 miles from the ruins of a large ancient village on Southhampton explored by Dr. Collins. Thus the new site, not more than a few hundred years old, is a close neighbor to the 1,000-year-old village once occupied by the Walrus Islanders' early ancestors.

Finds at both Walrus Island and Southampton showed that the tools of the Dorset people were characterized by fine, delicate workmanship on an almost microscopic scale. Stone blades were found that measure only a half inch in length, only about a third the size of an ordinary paper clip.

They used some of these tiny tools to make delicate carvings on ivory of human and animal figures, and other types as side blades on their weapons. The later Dorsets lived in stone houses with roofs presumably of skin.

Some three-room houses were in the shape of a clover leaf.

Tools found on the older Southampton site were of a much earlier but more refined stage of the same culture as that on Walrus—what Dr. Collins calls Proto-Dorset culture.

The Dorset tools contrast in size and workmanship with those of another Arctic people, the Thule people. But both these ancient peoples mingled in exchanges of both ideas and probably blood. Both are related to the modern Eskimo.

Where the average Dorset harpoon head measures about an inch and a half, a comparable Thule head measures three inches.

The tiny Dorset tools show a connection with the 6,000-year-old Denbigh culture, remains of which have been found on the coast of Alaska. They are also very much like the tiny tools found in Middle-Stone-Age sites in the Old World, including Siberia and Western Europe, Dr. Collins reports.

Thus the tools and engravings of the Dorset people of the Canadian Arctic add a new page to the history of the settlers of America and their passage from Siberia and Alaska over the extent of American soil.

Accompanying Dr. Collins on the expedition this summer were: Dr. J. N. Emerson of the University of Toronto, William E. Taylor Jr. of the National Museum of Canada, and James V. Wright, graduate student of anthropology at the University of Toronto. The expedition was undertaken jointly by the Smithsonian, the National Museum of Canada and the American Philosophical Society.

Science News Letter, October 29, 1955

VETERINARY MEDICINE

Magnets Prescribed for Treating Cow Ailment

➤ Rx for bovine traumautic gastritis: one alnico bar magnet, two and one-half inches by one inch in size, taken orally.

By prescribing magnet for internal use in cattle, Dr. R. E. Carroll, dairy veterinarian in Buena Park, Calif., has been able to reduce the number of operations to remove harmful metal objects in their stomachs from 57% to five percent of test animals.

In the course of feeding, cattle pick up quantities of "hardware," such as nails and pieces of bailing wire, which cause the important internal disorder, traumatic gastritis. As resident veterinarian for a large dairy concern, Dr. Carroll has had to perform over 200 operations a year for the removal of hardware in cattle.

Dr. Carroll believed that a bar magnet in a cow's stomach would collect this miscellaneous hardware, and keep it from puncturing or wounding the stomach wall. To prove his point, he made 42 heifers swallow the 2½-by-1-inch magnets, while he kept 58 untreated heifers as controls.

In the first six months of the test, 33 of the 58 control heifers (57%) required operations to remove hardware from their stomachs. During the same period only two of the 42 "magnetized" cows (5%) required operations. In one of these two cases, evidence indicated that the offending metal was present before the magnet was given to the cow.

To see how the magnets work in the cows, one of the "magnetized" heifers was operated on and the magnet removed. The magnet was holding fast to two wires, a piece of ferrous material and numerous iron filings.

No foreign objects other than those attached to the magnet were found in the cow's stomach.

Dr. Carroll reported his experiment in the *Journal of the American Veterinary Medical Association* (Oct.).

Science News Letter, October 29, 1955

MEDICINE

Alert Doctors to Tropical Disease in U. S.

➤ A REPORT alerting doctors to watch for a tropical disease never before seen in the United States appears in the *Journal of the American Medical Association* (Oct. 15).

The warning is to test for it among prospective blood donors as well as to suspect it in children in the Southwest who develop a vague, feverish illness.

The disease, previously found only in Mexico and Central and South America, is called Chagas' disease, or American trypanosomiasis.

The first case in the United States is that of a 10-month-old baby girl in Texas, reported by Drs. Norman C. and Hannah B. Woody of Corpus Christi, Tex.

She lived in an area where opossums and "blood-suckers" had been seen and her father had been bitten by the bugs. The blood-suckers are triatomid bugs and are known to carry the germs from animals, such as opossums, to man. Armadillos, mice and wood rats may also harbor the germs. Infected blood-suckers have been found in the United States before.

The little girl when first seen was thought to be suffering from an unknown virus disease. She had fever, was listless and irritable and there was puffiness around her eyes. Later it was thought the baby might have leukemia. Careful blood examinations finally showed the presence of the germs, and antibiotics were given. At last report she had no fever but continued to be somewhat irritable and showed puffiness around the eyes. Germs could still be seen in her blood.

Besides irritability, symptoms of this disease may be typical of encephalitis, or inflammation of the brain.

The warning to test prospective blood donors comes because the germs, or parasites, causing the disease have been known to live as long as 257 days in human blood.

Science News Letter, October 29, 1955

GENERAL SCIENCE

Umbrella-Like Solar Cooker Roasts Hot Dogs

➤ A NEW solar cooker folds up like an umbrella for carrying, but inverted in the sun it becomes a device so effective in concentrating the sun's heat that hot dogs can be roasted at the "handle" heat focus.

Devised by Dr. George O. G. Lof, a Denver, Colo., consulting chemical engineer, the solar cooker was seen in Washington, D. C., while Dr. Lof was serving as a consultant to the Resources for the Future organization.

The fabric of the upside-down umbrella sun cooker is a special reflecting plastic material. The shape of the device is paraboloid so that the sun's rays falling upon it are concentrated at one point where the cooking can be done.

Dr. Lof takes his umbrella cooker out in an open space on a sunny noonday and prepares lunch without fuel or flame. He foresees that his cookers, when available on the market, will find use on beaches and in recreation areas where fires are prohibited.

While the new solar cooker looks like an umbrella, it has a somewhat different shape in order to concentrate the heat properly. In making the first of his models, Dr. Lof sought the help of a professional umbrella maker. This did not work out satisfactorily, as the umbrella maker insisted on making it in a conventional umbrella shape which is not correct for heat concentrating.

The new solar cooker will be one of the exhibits at the World Symposium on Applied Solar Energy at Phoenix, Ariz., beginning Nov. 1.

Science News Letter, October 29, 1955

ASTROPHYSICS

Fusion Throws Light on Evolution of Universe

➤ FUSION of atomic hearts, the reaction which releases energy in the H-bomb, powers the building up of chemical elements in the stars. Evolution of stars, from fiery youth to cold and shrunken age, is believed by astronomers to be accompanied by fusion synthesis of heavier elements from the light gases hydrogen and helium.

New chemical understanding of how light elements can build up into heavier ones has just been offered the scientific world by Dr. W. A. Fowler, Fulbright scholar on leave from the California Institute of Technology, working in the Cavendish Laboratory, Cambridge University, England, with Dr. G. R. Burbidge and E. Margaret Burbidge.

The new theory supplements the so-called "carbon stove" reaction described by Dr. Hans Bethe, which was the first adequate scheme to account for the known phenomena of solar radiation. It applies information about isotope transformations learned in recent studies of fusion reactions to the problem of how the stars can build up heavy elements. The question of whether matter is continuously being created out of energy or whether the elements are merely evolving out of some form of primeval matter is not considered by Dr. Fowler and the Burbidges, whose studies of stellar evolution appear in the *Astrophysical Journal* (Sept.).

Continuous transformations which will build elements as heavy as magnesium, 12th in order of atomic weight, are described and a possible scheme of evolution of stars consistent with a series of such transformations is given. Heavy elements, according to this scheme, would be formed in stars which have reached the stage described as "cool giants." Matching the stars' places in chemical classification with their types as classified by astronomers may show whether unusual kinds of stars are young or old in cosmic time.

Science News Letter, October 29, 1955

IN SCIEN

INVENTION

New Device Combats Elevator "Stomach"

➤ SCIENTISTS HAVE found a way to eliminate the stomach's ups and downs during an elevator ride.

A "mechanical stomach," described as capable of outsensing the human stomach, has been developed by L. A. Bobula, a research scientist at the Westinghouse Research Laboratories in Pittsburgh.

The device measures and records every speed-up or slow-down an elevator makes. With this information, it will be possible to individually adjust the elevator controls and eliminate any discomfort to passengers.

What it does, stated Dr. C. R. Hanna, associate director of the laboratories, is to act as a special kind of accelerator. With its development, he pointed out, has come the passing of the phrase, "Bring my stomach down on your next trip."

Science News Letter, October 29, 1955

NUTRITION

"Antibiotic-Burgers" May Be on the Way

➤ ANTIBIOTIC-BURGERS may be the next addition to the menu of the corner "greasy spoon."

The presence of small amounts of aureomycin will keep hamburger meat from souring several days longer than meat kept under refrigeration alone, Dr. A. Z. Palmer of the University of Florida Agricultural Experimental Station, Gainesville, Fla., has discovered.

Even when kept at low temperatures, hamburger meat has a bad habit of souring in a couple of days, due to bacterial action. So Dr. Palmer reasoned that a pinch of aureomycin might defeat the food-spoiling germs.

In experiments he found that as little as ten parts of the antibiotic to a million parts of hamburger kept the meat in good condition for at least ten days, while untreated samples were soured in from four to 10 days.

Both batches of meat were kept under proper refrigeration during the tests.

The process is not commercially usable yet, he cautions, since the effects of the aureomycin on humans eating the meat has not yet been thoroughly studied. Some people, for instance, are highly allergic to the antibiotic.

It may be that any harmful effects from the aureomycin might be eliminated by proper cooking of treated meat, Dr. Palmer suggests, making the antibiotic more generally useful as a preservative.

Science News Letter, October 29, 1955

CE FIELDS

CONSERVATION

Winter Spreads Effects Of Polluted Streams

➤ WHAT happens to polluted streams in winter?

A team of scientists who donned hip-boots and field clothes and braved the Ohio winter to find out, learned that pollution from sewage affects a much wider area in the cold months than during summer in their experimental stream.

The scientists found that low temperatures and faster water flow during winter cause the organic wastes to form a life-killing blanket over the stream bottom in downstream areas that were clean and pollution-free in summer. This occurred, they noted, in spite of the increase of oxygen in the cold water due to more rapid flow.

The experiments were carried out in Lytle Creek, a tributary of the Little Miami River which enters the Ohio at Cincinnati. Drs. Arden R. Gaufin of the U. S. Public Health Service and Clarence M. Tarzwell of the Robert A. Taft Sanitary Engineering Center, Cincinnati, reported the research in the *American Midland Naturalist* (June).

The downstream extension of the pollution brought about a significant lowering in the kinds of insects and other invertebrates in the lower clean water section of Lytle Creek, they said. One type of worm which thrives only on polluted bottoms was found in winter numbering 3,000 per square foot in what during summertime is a clean water area.

Science News Letter, October 29, 1955

MEDICINE

More Dependable Drug for High Blood Pressure

➤ BETTER RESULTS in treating high blood pressure patients seem likely from a new drug reported to the American Heart Association meeting in New Orleans.

The report came from Dr. John H. Moyer and associates of Baylor University, Houston, Tex.

The drug is a nerve-blocking drug called mecamylamine. Its better results are expected because it is completely absorbed from the intestinal tract when given by mouth. It is the first such drug that is completely absorbed.

Older nerve — or ganglionic — blocking drugs such as hexamethonium and pentolinium are only 10% to 20% absorbed. As a result, there is a considerable chance that the blood pressure may sometimes be brought down too far.

With mecamylamine the blood-pressure-reducing effect is consistent from day to day in a particular patient although each patient reacts differently to the drug. Smaller doses can be given, but the dose must be carefully adjusted for each patient and each must be carefully watched by the doctor, since the drug can produce serious side effects. All three ganglionic-blocking drugs set up a chemical blockade of the nerve impulses responsible for constricting blood vessels. This effect sometimes is achieved through surgery to cut certain nerves in the operation known as "sympathectomy."

Science News Letter, October 29, 1955

BIOLOGY

Introduce Wetland Hungarian Partridge

➤ A NEW STRAIN of wetland Hungarian partridge is being experimentally introduced into western Oregon, reports V. W. Masson, in charge of upland game bird studies for the state game commission at Portland.

Recently, 265 one- and two-year-old birds of the wetland strain were released near Sublimity as a nucleus stock for wild bird production.

The birds were originally received from Denmark where rainfall and other weather conditions somewhat resemble those of the West Coast. Close check will be made to determine how well the wetland birds adapt to their new home.

The wetland partridge is about twice the size of the valley quail, but, even though its coloration differs somewhat, under field conditions hunters would have difficulty distinguishing between the two, especially when on the wing.

Science News Letter, September 17, 1955

ELECTRONICS

Atom Rays Improve Some Electrical Insulators

➤ WHAT WILL happen to electrical wiring exposed for long periods of time to atomic rays from a nuclear power plant?

Some insulation will break down, some will show no ill effects, and some varieties will even improve, the meeting of the American Institute of Electrical Engineers learned.

The effect on a particular insulating material is difficult to predict, P. H. Klein and Clifford Mannal of the General Electric Company reported in Chicago.

For doses up to 100,000,000 roentgens, polyethylene tape and Formex wire enamel undergo discernible decreases in the resistance to short-time voltage breakdown. Cellulose acetate shows little change under the same conditions, and polyvinyl chloride shows some distinctly favorable alterations after irradiation.

Mica-and-glass tape impregnated with silicone resin—an inorganic insulator—is virtually unaffected even at radiation levels up to 10,000,000,000 roentgens, the researchers stated.

Science News Letter, October 29, 1955

AGRICULTURE

Disease Kills One-Third Of Pigs Before Weaning

➤ BIG BAD WOLF or not, the chances for all three of the little pigs to grow up were mighty slim.

In fact, reports the American Veterinary Medical Association, Chicago, about one out of every three pigs born each fall dies before reaching weaning age. By reducing this high mortality rate, farmers have an easy means of stepping up their pork production efficiency.

Here are some recommendations by the AVMA for saving more fall pigs:

1. Keep only healthy sows.
2. Have clean quarters for farrowing, and be sure the sows are scrubbed, too.
3. Use heat lamps to prevent chilling until the pigs are several weeks old.
4. Where possible, raise the pigs on clean sod lots.
5. Vaccinate pigs against hog cholera about weaning time.
6. In areas where erysipelas is a problem, vaccinate against this disease, too.
7. Watch for disease symptoms, and get accurate diagnosis and treatment as soon as possible.

Science News Letter, October 29, 1955

CHEMISTRY

Water Rolls Off Glass With New Film

➤ WHEN PLANES of the future prepare to attack the thermal barrier, a water repellent will be ready for their windshields. It has already been developed.

The new heat-resistant silicone film, less than a millionth of an inch thick, makes raindrops ball up and roll off the windshields. The new substance clings tightly to the pane, being related to glass in that they both contain the element silicon.

The silicone film sloughs off water as efficiently as previous paraffin-based repellents, but it can stand up under intense heat and lasts for months. Some paraffin coats have to be replaced after each rainy flight.

Windshield wipers, which suffice for the automobile, cannot flap fast enough to brush away the rain as a plane comes in for a landing. The wiper works best at slow landing-field taxiing speeds. During cruising, rain is not a great problem since the water dries quickly, and because the plane can climb above the weather.

The new compound, developed by the Boeing Airplane Company, Seattle, Wash., and called BR-11, has been tested successfully on one pane of the company's 707 jet transport. On a rainy-day approach the pilot could see the runway clearly three miles away through the treated pane, while the landing strip was not visible through the other glass until one mile from the field.

Similar success was reported for limiting ice formation on a B-47.

Science News Letter, October 29, 1955

ANTHROPOLOGY

Indians Had Masks Too

American Indians used the mask as an important part of their religion. Trick or treat was practiced by young Sioux braves, too.

By HOWARD SIMONS

"AN' THE GOBBLE-UNS'LL git you ef you don't watch out!"

This was James Whitcomb Riley's Halloween warning to all young merry-makers on the eve of the Feast of All Saints.

And, what better way is there to ward off the goblins and their eerie comrades—the witches and gnomes, ghosts and elves—than by wearing a mask. Especially if the mask is so terrifying that it will scare off even the frightening demons once believed to roam the earth on All Hallow's Eve.

The youngster who puts on a false face this Halloween is following a custom that dates back to primitive man. The mask is widespread. It served the barbaric tribesmen of prehistoric Europe and the highly cultured ancient Chinese. In almost every instance, the mask was used to either invoke a spirit or frighten one off.

The early Celts of Western Europe, for instance, thought of the fall as a time when fairies emerged from their underground haunts to taunt and tantalize man on earth. The prehistoric Celt feared that these merry-making spirits could carry him off and even bring back the dead on their "Hallowe'en."

To save himself from the fairies, the Celt fashioned grotesque masks, which he hid behind and scared away these mischievous fairies.

The history of the mask can be traced from the frozen tundra of northern Siberia, where women wore masks to keep the spirits of killed animals from gaining revenge, to the tropical Congo, where witch doctors still practice masked medicine.

Masks Before Columbus

But in no other country has the mask played as integral a part in the society as in the United States. Here, the American Indian, long before Columbus, used the mask in his ritual and culture.

Of course, the American Indians took their masks much more seriously than does the young American in countless cities throughout the nation on Halloween.

Indian masks were believed to give the wearer power to ward off or cure illness. If the masks were mistreated or neglected, the Indians thought that this could cause the mask to become "poison." The "poison" could then stir up the resentment of the forces that the mask represented.

The mask has been, and in many cases still is, used by the Indian throughout the North American continent. Its history and significance have been traced from the fishing villages of the Pacific Northwest to the swamps of Florida, and from the frozen land of Canada's Eskimos to the cave-dwellers of the Southwest.

Materials used in making the Indian masks are closely allied with the Indians' environment.

The Iroquois of New York State and Canada, for instance, used basswood and pine or corn husks. More recently, this tribe has used white cloth. The Cherokee and Tuscarora of North Carolina, on the other hand, used buckeye wood, the skin of groundhogs, wasp nests and corn husks, and recently, cardboard.

The Delawares used wood and corn husks, and the Shawnee of Oklahoma used corn husks almost exclusively. But the Wabanaki, who inhabited the maritime provinces of southern New England, utilized the deer's scalp, complete with antlers.

Eskimos inhabiting Labrador, fashioned their masks from the skins of seals, foxes, dogs and caribou. In contrast, the Northern Plains Indians of Canada used the buffalo hide and in recent times, canvas.

The use of the mask had particular importance among the Iroquois and Delaware Indians to whom the masking custom was highly religious and very important as a cure and preventive of disease.

Among the Iroquois people there are two masking societies, the False Face Medicine Society and the Husk Face Society. Many masks used by these Societies are made of wood and painted red or black. They have long hair, distorted mouths, broken noses and wry expressions.

Corn Husks Used

Those of the Iroquois made from corn husks have another significance. They represent the spirits of agriculture and promise fertility and good crops. They are messengers of the three sisters—corn, beans and squash—the supporters of life.

(Curiously, Halloween has its deepest historical roots in agriculture. In Europe, where the custom began, man celebrated this time of the year as a sign of thanks for good harvest.)

Another unusual mask custom of the American Indian is that of the North Carolina Cherokees. In addition to using the masks in medicine and religious ritual, the Cherokees use them in a traditional drama depicting the worst aspects of the white invaders and symbolizing the diseases they introduced.

In the Southwest, it is believed that the masked religious dances of the Zuni Indians

TRICK OR TREAT—These frolicsome-looking trick or treaters whom you might expect to come knocking on your door this Halloween are really models of Iroquois medicine men to be found in the American Museum of Natural History. They belong to the False Face Society dancers.

began as a means of communication. Braves, masked accordingly, acted out the parts depicting gods and what they were being asked to do in the rain dance or the corn dance.

The Sioux used a mask to help strengthen a young brave's character. Soon after the young Indian ceased being afraid of thunder, he was given a Thunderbird mask to wear. With the mask, he tried to frighten others.

The Thunderbird mask and the modern trick or treat custom of Halloween have a tie-in. The young brave, with his mask, would knock on the door of his relatives' tents and try to scare them. The older Indians, in mock fear, bribed the young brave with gifts to go away.

Among the Delawares, too, an early trick or treat custom can be found. These Indians give a feast and dance for the mask spirit. Traditionally, a mask is used by the Delawares to scare unruly children, who are taught to buy the "grandfather" off with gifts of tobacco.

Halloween has probably been accepted more in the United States than in any other nation. And although the wearing of false faces is widely practiced, it is today only a vestige of what was once thought to be a supernatural power.

The "trick or treat" custom is now departing much further from the old Indian way as civic-minded adults are teaching the costumed children to beg for a worthy cause, such as the international UNICEF (United Nations Children's Fund), instead of for goodies to eat or carry away in a big paper bag.

Science News Letter, October 29, 1955

GENERAL SCIENCE

Strong Nation Needs Science Experience

➤ AMERICAN YOUTH must have experimental experience in science and technology in order that the nation remain at the forefront of world progress necessary for either a peaceful or troubled world, Watson Davis, director of SCIENCE SERVICE, Washington, D. C., told the Topeka Science Fair banquet in Topeka, Kans.

Addressing teachers and business men assembled by the *Topeka Daily Capital* to inaugurate the plans for Topeka's first science fair, Mr. Davis emphasized that the inspiration and knowledge high school youth will gain from making exhibits to be shown next April will result in more scientific manpower so urgently needed.

At about 100 other places throughout the nation, similar science fairs will be held and the winners of each will compete in the Seventh National Science Fair to be held under SCIENCE SERVICE auspices at Oklahoma City next May 10 to 12.

Science News Letter, October 29, 1955

Since the discovery of *antibiotics*, accidents of all types are ahead of diseases as a cause of death among the age group from one year to 44 years.

ICHTHYOLOGY

Planting of Fish Holds Promise for Sport Fishing

➤ TWO TYPES of salt-water fish successfully planted in California's Salton Sea promise to make it a sport fishing center.

Dr. Boyd Walker, University of California at Los Angeles ichthyologist, has directed investigations of the salty inland sea's ability to support large fish populations.

Two types of fish—pan-sized gulf croakers and large, gamey corbinas—seem to be adapting to the desert sea's tepid waters. The croakers were introduced in 1950 and 1951 and have multiplied rapidly. The corbinas were planted only two years ago, but are increasing at a rate promising good fishing in two or three years.

Other facts learned in the study were:

1. The inland sea is rising about a foot a year. It is now only 234 feet below sea level, compared to 235 feet a year ago. (Runoff irrigation water empties into the Salton Sea.)

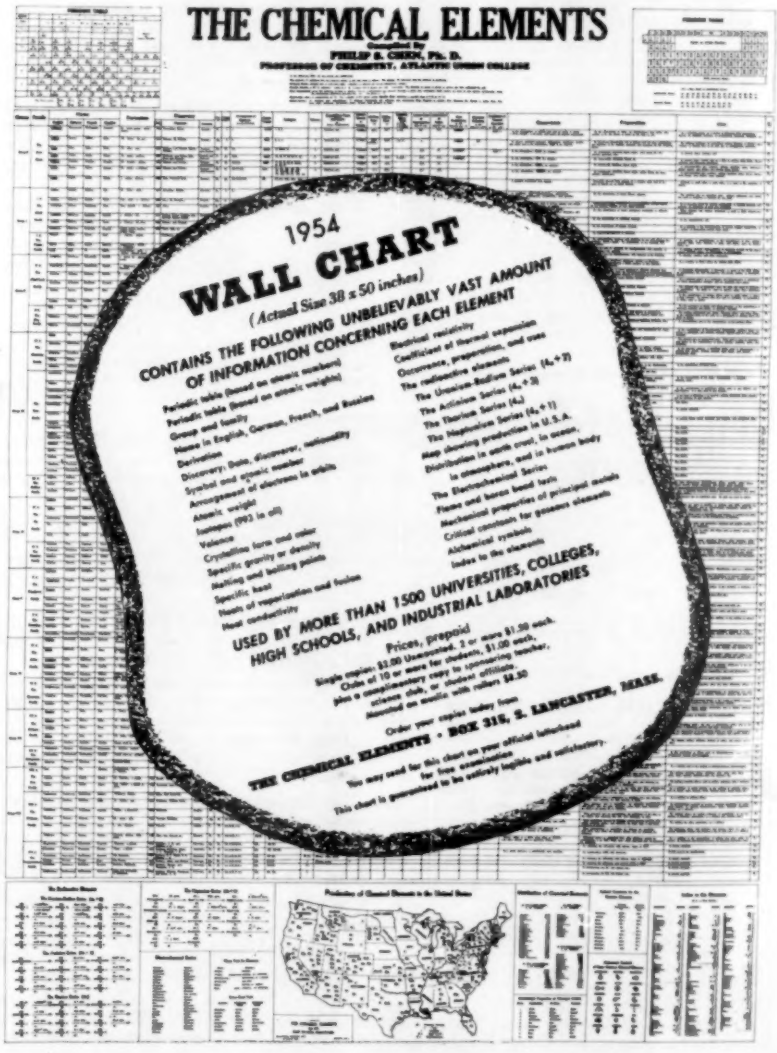
2. It is becoming less salty, but apparently not enough to be significant biologically.

3. It produces more diatoms, or microscopic plants, per unit volume than the ocean. A maximum of 52,000,000 of these tiny plant cells per liter has been recorded from the Salton Sea, compared to an ocean maximum of about 1,000,000.

Diatoms float free in the water and, upon death, settle to the bottom, contributing to the rich organic mud that supports a great population of annelid worms. These worms, in turn, are the primary food source of Salton Sea fish.

Assisting Dr. Walker on a full-time basis are Dr. Lars Carpelan, Dr. Richard Whitney and Richard Linsley, all stationed at the Salton Sea.

Science News Letter, October 29, 1955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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

THE ADVANCEMENT OF SCIENCE: Vol. XII, No. 46—*British Association for the Advancement of Science*, 140 p., illus., paper, 7 s. 6 d. Addresses delivered at the annual meeting of the Association in Bristol Aug. 31-Sept. 7, 1955.

THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR THE YEAR 1957—Nautical Almanac Office, U. S. Naval Observatory — *Govt. Printing Office*, 586 p., illus., $4.50. Contents are practically the same as those of previous volumes of this essential reference work.

AMERICAN PHILOSOPHY—Ralph B. Winn, Ed. —*Philosophical Library*, 318 p., $6.00 About American thinkers and their contributions from William Penn and Benjamin Franklin to John Dewey and FDR.

ANGEL OF MERCY: The Story of Dorothea Lynde Dix—Rachel Baker—*Messner*, 191 p., illus., $2.95. A biography of the illustrious woman whose efforts revolutionized the treatment of the mentally ill in this country.

ATOMIC PHYSICS: An Atomic Description of Physical Phenomena—Gaylord P. Harnwell and William E. Stephens—*McGraw-Hill*, 401 p., illus., $8.00. A text for first year graduate work.

THE BEQUEST OF THE GREEKS—Tobias Dantzig—*Scribner's*, 191 p., illus., $3.95. Not a history of mathematics, but a discussion of those mathematical ideas and inventions of the Greeks which are still useful to us in the modern world.

BIOCHEMISTRY OF THE DEVELOPING NERVOUS SYSTEM: Proceedings of the First International Neurochemical Symposium Held at Magdalen College, Oxford, July 13-17, 1954—Heinrich Waelsch, Ed.—*Academic*, 537 p., illus., $11.50. Including both reviews and short summaries of original work.

THE BOY SCIENTIST: A Popular Mechanics Book — John Lewellen — *Simon and Schuster*, 264 p., illus., $3.95. Introducing the young science enthusiast to great scientists and their work and suggesting experiments the reader can perform.

CATTLE & MEN—Charles Wayland Towne and Edward Norris Wentworth—*University of Oklahoma Press*, 384 p., illus., $4.00. The story of cattle is to a certain extent the story of man and of what they have done for each other over the ages.

CHEMICAL PROCESSING AND EQUIPMENT — United States Atomic Energy Commission—*McGraw-Hill*, 302 p., illus., $6.00. Laboratory design, decontamination, health physics, analytical methods, materials handling equipment, irradiation facilities and many other details of operation at the Idaho Chemical Processing Plant compiled for the AEC by the various laboratories with the essential experience.

CHILD BEHAVIOR—Frances L. Ilg and Louise Bates Ames—*Harper*, 364 p., $3.95. Advice on what to do about the everyday behavior problems of children based on studies at the famed Gesell Institute of Child Development.

COST ANALYSIS OF STREAM POLLUTION SURVEYS—Linvil G. Rich and David A. Jones—*Virginia Polytechnic Institute*, Engineering Experiment Station Series No. 103, 30 p., paper, 50 cents.

A DEER IN THE FAMILY—Adapted from a true story by John Hartmann, Translated from the Danish by Edith M. Nielson—*Dutton*, 58 p., illus., $2.50. A story for children about a Danish family that adopted a newborn fawn and later the deer's fawn twins. Illustrated with beautiful photographs.

THE EDGE OF THE SEA—Rachel Carson—*Houghton Mifflin*, 276 p., illus., $3.95. Beautifully illustrated and engagingly written account of the interesting life along the shore.

THE EXPRESSION OF THE EMOTIONS IN MAN AND ANIMALS—Charles Darwin with preface by Margaret Mead—*Philosophical Library*, authorized ed., 372 p., illus., $6.00. A new edition of a classic with modern illustrations.

FINCHES — Ian Harman — *All Pets*, 138 p., illus., $4.00. A guide for the novice on the care and breeding of these beautiful birds.

THE FIRST MAMMALS—William E. Scheele—*World Publishing*, 128 p., illus,. by the author, $4.95. A book intended for reference and describing for children and their elders the development of mammals from their reptilian ancestors.

THE FORESEEABLE FUTURE—Sir George Thomson—*Cambridge University Press*, 166 p., $2.50. A Nobelist foresees the developments that may occur in this world provided it is not destroyed by peculiarly catastrophic wars.

THE HISTORY OF THE TELESCOPE—Henry C. King with foreword by Sir Harold Spencer Jones—*Sky*, 456 p., illus., $12.50. From the days of the first primitive instruments making use of lenses to the modern radio telescopes.

HOW TO BUILD 20 BOATS—Rube Allyn and others—*Arco*, 138 p., illus., $2.00. Plans, lists of needed materials, and instructions for building a variety of boats from an eight-foot dinghy to a 24-foot cruiser.

INCOME OF THE AMERICAN PEOPLE—Herman P. Miller—*Wiley*, 206 p., $5.50. For 1950, over 200 tax returns were filed for incomes of $1,000,000 or more, but one half of the income receivers got less than $2,000.

INTERNATIONAL REVIEW OF CYTOLOGY: Volume IV—G. H. Bourne and J. F. Danielli, Eds. —*Academic*, 419 p., illus., $9.00. Bringing together isolated "pockets of knowledge" in this fast growing science.

INTRODUCTION TO CHEMICAL ENGINEERING—Walter L. Badger and Julius T. Banchero—*McGraw-Hill*, 753 p., illus., $9.50. A text for beginners who have, however, a working knowledge of chemistry, elementary physics, and mathematics through the calculus, as well as elementary knowledge of machine parts and construction.

INVESTIGATIONS ON GENETIC ASPECTS OF CARCINOMA OF THE STOMACH AND BREAST—Charles M. Woolf—*University of California Press*, 85 p., paper, $1.00. Reporting an attempt to determine the part of heredity in human cancer. The study was carried out in Utah where families are close knit and where genealogies are available.

JET TRANSPORTS — John Lewellen — *Crowell*, 151 p., illus., $2.50. A book for children about commercial planes of the present and future.

JUNIOR INTERN—Alan E. Nourse—*Harper*, 210 p., $2.50. Presenting for young people some facts about life and work in a hospital and also some of the reasons for entering the medical profession. The author is himself an intern in a Seattle, Washington, hospital.

LAUGH AND CRY: Your Emotions and How They Work — Jerrold Beim — *Morrow*, 47 p., illus., $2.00. Elementary psychology for little children.

MEDICAL PROBLEMS OF OLD AGE—A. N. Exton-Smith with foreword by Rt. Hon. Lord Amulree—*John Wright (Williams & Wilkins)*, 332 p., illus., $7.00. Although old age is unavoidable (except by dying young) many of the adverse effects are preventable. This volume is intended especially for the general practitioner who can help maintain health in the aged.

METALLURGICAL PROGRESS — 2: A Second Series of Critical Reviews—J. M. McLeod and others—*Louis Cassier (Philosophical Library)*, 71 p., $6.00. Metallurgical research workers here have the literature searched for them by the staff of the Royal Technical College, Glasgow.

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MINING DEVELOPMENT IN ASIA AND THE FAR EAST 1953-1954 — Economic Commission for Asia and the Far East—*United Nations (Columbia University Press)*, 83 p., illus., paper, 70 cents. Production, in general, has shown a substantial improvement.

MUTUAL AID: A Factor of Evolution—Petr Kropotkin, Foreword by Ashley Montagu—*Extending Horizons Books*, 362 p., paper, $2.00, cloth $3.00. A republication of what Dr. Montagu calls "one of the world's great books." In it a Russian scientist presents the thesis that cooperation is a more fruitful and successful factor in evolution than is competition or strife. The volume contains Huxley's "The Struggle for Existence."

NEUTRON CROSS SECTIONS—Donald J. Hughes and John A. Harvey — *McGraw-Hill, U. S.* Atomic Energy Commission, 328 p., illus., $12.00. Tables of thermal cross section values and of resonance parameters of a number of isotopes of each element and diagrams showing cross section curves and angular distributions as functions of energy.

THE OCTOPUS—Olive L. Earle—*Morrow*, 64 p., illus., with drawings by the author, $2.00. The octopus and his relatives are presented in attractive fashion for children and it is explained that he gets around by the same principle as that used in the jet airplane.

ON BEYOND ZEBRA — Dr. Seuss — *Random House*, 54 p., illus., $2.50. Not science, but delightful phantasy describing strange creatures whose names begin with "letters" beyond Z for Zebra.

THE PERSONALITY OF THE YOUNG CHILD: An Introduction for Puzzled Parents—Margaret A. Ribble — *Columbia University Press*, 126 p., $2.75. Telling parents of the psychological needs of the toddler and pre-school child.

PLASTICS AND BUILDING—E. F. Mactaggart and H. H. Chambers—*Philosophical Library*, 181 p., illus., $12.00. For architects, builders and industrial engineers.

THE PRACTICAL NURSE AND HER PATIENT—Fern A. Goulding and Hilda M. Torrop—*Lippincott*, 326 p., illus., $4.25. Specific practical suggestions and instructions for the practical nurse from the arrangement of flowers to providing diversions for child and adult patients.

PROSPECTING FOR ATOMIC MINERALS: How To Look For and Identify Atomic Ores, Stake and Protect a Claim, Evaluate and Sell Your Minerals—Alvin W. Knoerr and George P. Lutjen —*McGraw-Hill*, 211 p., illus., $3.95. For the amateur prospector.

PSYCHOLOGY AND "THE GREAT GOD FUN:" Nineteen Informal Studies of Learning and Growing With Young People in Psychotherapy and Education—A. E. Hamilton—*Julian*, 189 p., illus., $3.50. Parents will find interest in this description of an experimental home for children in which normal children are allowed to develop normally and in which child problems are solved.

THE QUANTITATIVE ANALYSIS OF DRUGS —D. G. Garratt—*Philosophical Library*, 2d ed., 670 p., illus., $17.50. A reference work for manufacturing firms and others.

RADIO ASTRONOMY—J. L. Pawsey and R. N. Bracewell—*Oxford University Press*, 361 p., 23 plates, $8.80. A textbook in a new branch of science.

RESEARCH REACTORS: Light Water Moderated, Light Water and Oil Moderated, Heavy Water Moderated and Graphite Moderated — United States Atomic Energy Commission—*McGraw-Hill*, 442 p., illus., $6.50. Descriptions in great detail of reactors actually built and in operation.

SCIENCE CLUBS OF AMERICA SPONSOR HANDBOOK — Margaret E. Patterson, Ed. — *Science Service*, 1956 ed., 64 p., paper, $1.00. Information helpful to those sponsoring or organizing a Science Club.

SCIENCE IN PROGRESS—George A. Baitsell, Ed. —*Yale University Press*, 9th series, 343 p., illus., $6.50. Authoritative reports on basic research by ten contributors.

SEALS AND WALRUSES — Louis Darling — *Morrow*, 63 p., illus. by the author, $2.00. Telling children about these little known animals.

A SOURCE-BOOK OF BIOLOGICAL NAMES AND TERMS—Edmund C. Jaeger—*Charles C. Thomas*, 3d ed., 317 p., illus., $5.75. Introductory material includes a section on "How Words are Built."

SPIDER, EGG, AND MICROCOSM: Three Men and Three Words of Science—Eugene Kinkead with introduction by E. B. White—*Knopf*, 244 p., $4.00. In this book, says the author of the introduction, Mr. Kinkead has "managed to assemble a very great amount of fascinating information about the world we live in."

STATIC AND DYNAMIC ELECTRON OPTICS: An Account of Focusing in Lens, Deflector and Accelerator—P. A. Sturrock—*Cambridge University Press*, 240 p., illus., $5.50. A theoretical monograph.

SUPPLEMENT TO UNIVERSITY PATENT POLICIES AND PRACTICES—Archie M. Palmer—*National Academy of Sciences-National Research Council*, 93 p., paper, $1.50. Bringing up to date and supplementing the material contained in an earlier monograph.

SURVEY DESIGN AND ANALYSIS: Principles, Cases and Procedures—Herbert Hyman with foreword by Paul F. Lazarsfeld—*Free Press*, 425 p., illus., $7.50. A manual for those who plan to make public opinion or marketing surveys.

TED TRUEBLOOD ON HUNTING—Ted Trueblood—*Arco*, 144 p., illus., $2.00. Suggestions for the sportsman.

THOUSANDS OF SCIENCE PROJECTS—Margaret E. Patterson and Joseph H. Kraus, Eds.—*Science Service*, 3d ed., 44 p., illus., paper, 25 cents. Exhibits shown at science fairs and projects in connection with competition in the Science Talent Search.

TRANSISTOR ELECTRONICS—Arthur W. Lo and others—*Prentice-Hall*, 521 p., illus., $12.00. Emphasis is placed on the circuit aspects of the transistor and the physical principles governing transistor operation.

WEATHERCASTING—Charles and Ruth Laird—*Prentice-Hall*, 163 p., illus., $3.95. Telling the amateur meteorologist how to build his own weather station and make his own forecasts.

THE WONDERFUL WORLD OF MATHEMATICS—Lancelot Hogben—*Garden City Books*, 69 p., illus., $2.95. A beautiful book, illustrated in color, showing the history of mathematics and its applications in our daily life.

THE ZOONOSES IN THEIR RELATION TO RURAL HEALTH—Karl F. Meyer—*University of California Press*, 49 p., illus., paper, $1.00. Describing the infections of animals that are secondarily contagious to men.

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ZOOLOGY

NATURE RAMBLINGS

by Horace Loftin

The "First" Mammal

➤ THE UNLIKELY creature whose portrait comes with this essay usually claims first place in any listing of animals. This is not because he is high or low on the mammalian family tree, however. It is simply because of his name, which at first glance seems as outlandish as the animal himself appears to be.

For he is an aardvark, whose double-a puts him at the head of any alphabetical roster of animals.

On closer inspection, though, both the name and appearance of the animal are not so outlandish as they seem. The name aardvark was given him by the Dutch settlers of South Africa, who found this pig-sized animal digging in the soil of their new homeland. Translated literally, aardvark means "earth-pig"—a perfect word picture.

Likewise, there are good "reasons" for each of the structures which put together on one animal add up to such an unusual beast—rabbit-like ears, strong, long-clawed limbs, long, narrow snout and thread-like tongue.

First, the ears. Aardvarks are good eating for many large beasts of prey, and so keen hearing lets him know when danger is near. Yet the over-sized ears are movable, and they can be folded out of the way when the aardvark tunnels into the earth.

The aardvark feeds almost exclusively on ants and termites. Thus, his narrow snout can be pushed into their nests, so that the sticky, thread-like tongue can delve through the tunnels in search of the insects.

The great limbs with their clawed feet allow the aardvark to dig into even the hardest sun-baked earth with amazing speed. Natives say that it is almost impossible to dig an aardvark out of its burrow, since it can tunnel faster than several men can dig with spades. It is reported that an aardvark can drag three men tugging on its tail.

So while the aardvark will never walk away with any animal beauty contest, the things that make it "ugly" also make it eminently fitted to survive in its harsh element.

Science News Letter, October 29, 1955

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GENERAL SCIENCE

More Science Learning Needed; Press Lauded

➤ THE WORLD'S PEOPLES should be taught the basic facts about the solar system, matter, energy and health just as they are the three R's. The daily press has an important role in this learning process.

This was the theme of a paper presented by Watson Davis, director of SCIENCE SERVICE, at the UNESCO Conference on Dissemination of Science in Madrid, Spain.

"The whole range of the world's peoples," Mr. Davis stated, "should receive and understand as much as possible about science, its origins, its present state, its directions and its effects upon the world."

This is achieved best, he pointed out, when scientific learning and the individual grow together.

"Even for those who are well-rounded in science, through their schooling." Mr. Davis added, "no matter how advanced it may be, there is need for a continuation of learning due to the rapid advancement of science and technology in the present years."

Newspapers, he said, are the most important channel through which current information can reach the people. The daily press has an obligation to report and interpret the advances of science as effectively and as accurately as it does the more traditional facets of the news, relating to politics, crime, sports, the arts and other human affairs.

Mr. Davis credited publishers and editors within the last two decades with having "fulfilled to a larger degree than in previous years this obligation."

"This is no accident," he reported.

"The onrush of the advances made in scientific fields has been paralleled with the realization by scientists that their work should be reported. This has resulted in the better climate and the greater attention that has been given by the daily press to the presentation of science."

Science News Letter, October 29, 1955

Questions

AGRICULTURE—Why are the Russian farms in the Siberian wastes believed doomed to failure? p. 278.

□ □ □

CONSERVATION — How could the flooded New England states have prepared for the rash of floods? p. 276.

□ □ □

MAMMALOGY—About how many European bisons exist today? p. 274.

□ □ □

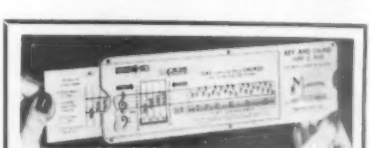
PHYSICS—How was the anti-proton created? p. 275.

□ □ □

VETERINARY MEDICINE—How are magnets used to treat cows? p. 279.

□ □ □

Photographs: Cover, University of California; pp. 274 and 279, Fremont Davis; pp. 277 and 282, American Museum of Natural History; p. 288, Eastman Chemical Products, Inc.



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CHEMISTRY

Cortisone From Rare Yams

➤ CORTISONE manufacture may be greatly simplified with the isolation of two new chemicals found in rare Mexican yams, the U. S. Department of Agriculture has reported.

The two compounds are described as the best ever found in nature as raw materials for making the arthritis-relieving drug. They were isolated from the yam's tubers by chemists at the Department's Eastern Utilization Research Branch in Philadelphia.

Discovery of the rare plant in remote southern Mexico climaxed several years search for the yam. Persistent rumors that such a plant with the desired chemicals existed had sent plant explorers looking for it time and again. Chemists were beginning to doubt the substance's existence when Drs. H. S. Gentry and D. S. Correll of the USDA found the plants.

The two plant explorers were honored for their find by having had the chemicals named for them, gentrogenin and correllogenin. The chemicals were isolated by Henry A. Walens, Samuel Serota and Monore E. Wall.

In describing the importance of the discovery and isolation, Dr. G. E. Hilbert, director of utilization research, said that the newly discovered plant chemicals are potentially much better as starting materials for the manufacture of cortisone by chemical means than any naturally occurring substance now known.

The major source of chemicals for making cortisone at present is ox bile. The unusual value of the yam's chemicals, scientists point out, is that each chemical contains two desirable chemical structures. Ordinarily, only one such structure is found in nature.

Samples of the yams were also shipped to the Department's plant-introduction garden at Glenn Dale, Md., for field tests. If they can be cultivated, they may prove to be an economical source of the raw material needed for cortisone manufacture.

Science News Letter, October 29, 1955

MEDICINE

Drug-Induced Anxiety Speeds Mental Recovery

➤ ANXIETY is such a driving force in psychic life that it can be used to speed recovery from mental sickness, Dr. Herman C. B. Denber of Manhattan State Hospital, Ward's Island New York, reported at the meeting of the Academy of Psychosomatic Medicine in New York.

Anxiety can be produced in patients by giving the drug, mescaline. The drug-induced anxiety drives the patient to discharge hurtful, pent-up feelings and to freely associate thoughts which help him become aware of previously repressed elements in his mental life. In this way it helps to recover from the mental illness. However, if mescaline is prevented from inducing severe anxiety by first giving the patient another drug, chlorpromazine, the patient suffers an inner mental paralysis, as shown by his silence, lack of mescaline-induced symptoms and recall.

These findings suggest, Dr. Denber said, that today's psychiatrists through the use of drugs can increase or decrease anxiety, and in this way reduce the periods of stagnation in the psychoanalytic process.

Science News Letter, October 29, 1955

The Expression of the
EMOTIONS
in Man and Animals
By CHARLES DARWIN
with a preface by
MARGARET MEAD

DARWIN approached the subject of expression of the emotions with all the force of a powerful imagination dealing with a new field. His list of ways in which the subject might be studied has not been improved upon and indeed has hardly yet been attempted: (1) the study of infants, (2) the study of the insane, (3) the use of photographs of emotional expression submitted to different judges, (4) the study of great paintings and sculpture, (5) the comparative study of expression and gesture among the different peoples of the earth, (6) the study of some of the commoner animals.

This book should keep us from the shades of the prison house which close on all of those who work only within the narrow tradition of their own age and science and forget the mightier imaginations which made those narrower ways possible and productive.

From the CONTENTS
Means of Expression in Animals. Special Expressions of Man: Suffering and Weeping. Low spirits, Anxiety, Grief, Dejection, Despair. Joy, High Spirits, Love, Tender Feelings, Devotion. Reflection — Meditation — Ill-Temper — Sulkiness — Determination. Hatred and Anger. Disdain — Contempt — Disgust — Guilt — Pride — Helplessness — Patience — Affirmation and Negation. Surprise — Astonishment — Fear — Horror. Self-attention — Shame — Shyness — Modesty: Blushing.

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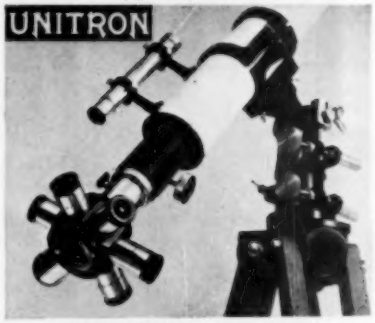

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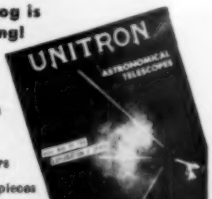

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UNDERWATER METAL LOCATOR has a meter pointer that deflects in the presence of ferrous or non-magnetic metals. Designed for skin divers, and salvage operators, the locator weighs only one and a half pounds when submerged.

Science News Letter, October 29, 1955

WEARABLE FLASHLIGHT that weighs only four and one-half ounces can be worn around the neck, on the chest or on the head. Almost square and made of plastic, the sportsman's flashlight comes equipped with a compass, or with a magnet to hold flies and hooks. It operates on two standard batteries.

Science News Letter, October 29, 1955

PORTABLE MACHINE is an electric tool that combines the functions of a jigsaw, router, jointer and shaper table. Designed for the homecraftsman, the tool has an AC-DC motor that turns a collet at 24-000 rpm. Measuring 4¾ inches wide by 6½ inches high, the home tool weighs only four pounds.

Science News Letter, October 29, 1955

GOLF BALL PICKUP for retrieving practice balls is a three-foot tube made of plastic. A slight downward pressure of the device, shown in the photograph, centers a ball and traps it in the tube. Rustproof and lightweight, the tube holds more than 20 balls.

Science News Letter, October 29, 1955

PILOTING INSTRUMENT is a miniature navigator for small boat owners. The 7½-by-10-inch card includes a star clock, star compass, course protractor, and time, speed or distance tables. The two-sided card is protected by plastic from oil and salt spray.

Science News Letter, October 29, 1955

LEARNING DEVICE for speech training is made for both children and adults with speech difficulties. A portable talking machine, the device reproduces the voice from printed cards. Tone and volume knobs are the only controls.

Science News Letter, October 29, 1955

HELMET ATTACHMENT offers added protection to the football player. Made of plastic, the clear, transparent face guard can be attached or detached to any helmet within 30 seconds. To remove his helmet, a player has only to unsnap the chin strap and swing the guard upward.

Science News Letter, October 29, 1955

DISPOSABLE DIAPER has a plastic coating over soft, absorbent non-woven fabric and fluffed cellulose pulp. About one-tenth the weight of cloth diapers, the combination diaper and baby pants are designed to be thrown away.

Science News Letter, October 29, 1955

Looking for a science project to exhibit in your area's science fair?

THOUSANDS OF SCIENCE PROJECTS

is just what the title indicates. Under a grant from the National Science Foundation, Science Service produced the booklet, listing many projects of students entering the National Science Fair and the Annual Science Talent Search programs. Library of Congress system of classification used to give information and arrangement.

Work *from* these listings, using the booklet for suggestions in pursuing your own ideas. Strive for your *own* interpretation of science problems.

For ideas, for illustrations of projects that have been shown in both fairs and searches, write for

THOUSANDS OF SCIENCE PROJECTS

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Please send me ..... copies of THOUSANDS OF SCIENCE PROJECTS at 25 cents for one copy, $1.00 for 10 copies, and mail to my address as imprinted on left.

$.....enclosed

10-29-5

Do You Know?

An invisible film to take the bumps and rubs can be added to dishes or glassware by dipping them in a solution of *silicone*, the inorganic rubber; tests are underway to make sure this skin will not come off on food.

Precipitous mountain ranges, such as California's High Sierra, may create disturbances high in the stratosphere and influence the *weather* of a continent.

An average man would appear 15 miles high if he could be placed under an electron *microscope* that magnifies 12,000 times.

The intensity of the *luminescence* that some rocks give off when heated is an indication of their geologic age.

Tomorrow's hybrid *plants* may be created by a portable radiation unit designed to induce mutations in the field.

The largest *icebreaker* in the free world, the U.S.S. Glacier, is now operating with the Navy.